

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Developing a Unified Intercarrier Compensation Regime)	
)	CC Docket No. 01-92
)	
To the Commission:)	
)	

**COMMENTS OF
Level 3 Communications, LLC**

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I. INTRODUCTION AND SUMMARY

In its Notice of Proposed Rulemaking (“Notice”)¹ on the development of a unified intercarrier compensation regime, the Commission asks whether the traditional model of assessing the cost of a call to the calling party and including a payment from the originating

¹ *Developing a Unified Intercarrier Compensation Regime*, Notice of Proposed Rulemaking, CC Docket No. 01-92, FCC 01-132 (rel. Apr. 27, 2001) (*Notice*).

network to the terminating network continues to make economic and regulatory sense.²

While the calling party network pays model (CPNP) may have once been the preferred way to compensate carriers, it has come under increasing attack as new networks, technologies and products develop their own economic models and receive different regulatory classifications. The CPNP model has come under increasing pressure on two fronts. First, the introduction of competitive local exchange carriers (LECs) into the local market has created multiple access points to not just the public switched telephone network but also a growing worldwide communications network. In that environment, it no longer makes sense to allow a carrier to assess costs based on the geographic location of the calling party and the called party of a communications service unless that carrier carries the complete transaction. Instead, carriers should only be allowed compensation for the functionality they provide in delivering traffic to another carrier's network.

The second assault on the calling party network pays model has come through the rapid pace of technological change in communications technology. The increasing deployment of Internet protocol (IP)-based networks presents a significant challenge to the Commission in establishing a more efficient intercarrier compensation regime. IP-based services do not fit easily into the legacy regulatory classifications that provide the foundation for the current pricing regimes and should not be "force fit" into those categories. Rather than attempt to draw imprecise lines that place IP services into existing, technologically irrelevant categories, the Commission should adopt a compensation regime that is technologically neutral and avoids regulatory distinctions.

² *Notice* at paras. 11-18.

Level 3 advocates moving the intercarrier compensation regime to a forward-looking cost based model so that carriers are compensated for the functionality provided with a reasonable profit. Level 3 believes, however, that absent a truly competitive market where carriers can negotiate compensation levels freely without one party exerting its market power, determining those costs would be time consuming, litigious, require considerable financial resources from carriers and regulators, and would not reach the desired result of a technologically and competitively neutral compensation mechanisms. Therefore, Level 3 recommends that the Commission consider a bill and keep compensation scheme where the originating and terminating carriers each recover their costs from their end-user customers, thereby eliminating a transfer of payments for the cost of the loop and local switching.³

Replacing all forms of intercarrier compensation with a bill and keep regime will ensure that carriers deploying advanced technologies reap the benefits of the cost savings inherent in these technologies. Such a regime should, therefore, lead to additional investment in advanced technologies and more efficient network deployment and usage by end-user customers. Moreover, requiring each carrier to recover the costs of origination and termination from its own end-user customers eliminates the need to fit traffic and technologies into artificial regulatory categories (e.g., telecommunications services, information service,

³ Notice at paras. 23-24. See Patrick DeGraba, *Bill and Keep at the Central Office As the Efficient Interconnection Regime*, Federal Communications Commission, Office of Plans and Policy (OPP) Working Paper No. 33 (Dec. 2000) (*COBAK Proposal*); see also Jay M Atkinson & Christopher C. Barnekov, *A Competitively Neutral Approach to Network Interconnection*, Federal Communications Commission, Office of Plans and Policy (OPP) Working Paper No. 34 (Dec. 2000) (*BASICs Proposal*)

interstate and intrastate services), and thus helps limit the regulatory arbitrage opportunities inherent in today's CPNP-based systems that are dependent on such classifications.⁴

Today's patchwork of intercarrier compensation regimes, including access charges and reciprocal compensation, is based on different, historical models of interconnection among carriers in a hierarchical, circuit switched network. As such, each is based on increasingly outdated regulatory constructs and is fundamentally at odds with a competitive marketplace and emerging Voice over Internet protocol (VoIP) services. If applied to VoIP, the current regimes and their cost structures would strangle this innovative service by imposing unnecessary and inefficient network design requirements and by stifling the range of product innovation. For the reasons explained below, Level 3 recommends that the Commission seriously examine a bill and keep compensation scheme for both local exchange and interexchange interconnection, whether landline or CMRS.

II. Background

A. About Level 3 Communications

Level 3 is a communications and information services company with the first international communications network completely optimized, end-to-end, for advanced IP technology. Level 3 offers IP-based services, including broadband transport, submarine transmission services, and the industry's first softswitch-based services. It also provides collocation services. Level 3 offers transport and bandwidth services primarily to other carriers, Internet services providers (ISPs), application service providers (ASPs), and voice-

⁴ See *Notice* at para. 12 (stating that one "source of regulatory arbitrage arises from the different rates that

over-IP service providers who utilize substantial amounts of bandwidth to deliver their services. Level 3's network is designed with softswitch architecture,⁵ which is a distributed set of hardware and software platforms that are used to seamlessly interconnect IP networks to the circuit switched network. Under a softswitch architecture, core switching functions are not handled in a single unit, such as in a circuit switch network. Instead, switching functions are distributed throughout the network. The result is a pure IP network that interoperates with the existing public network.

Although Level 3's all IP softswitch-based network architecture is constructed to take full advantage of the rapidly decreasing costs of moving information in packetized form, consumers will not benefit from the pace of technological change that drives those costs down unless companies offering those advanced services are able to interconnect and exchange traffic with the existing public circuit switched network without being saddled with the economic inefficiencies of those legacy networks. To do this requires either pricing interconnection at true forward looking economic costs, or shifting to a compensation-free exchange that places the costs of using the less efficient network on the user who chooses to subscribe to that network. To understand why the Commission should pay particular attention to the implications of interconnection pricing on the provision of IP-based voice, it is necessary to understand the current interconnection pricing regimes and what voice over Internet protocol is and how it will benefit consumers.

different types of service providers must pay for essentially the same types of calls.”).

⁵ Level 3's all IP network contains no circuit switches.

B. Overview of Current Interconnection Pricing Regimes

In the *Notice*, the Commission acknowledged that interconnection arrangements between carriers are complex and vary depending on the type of carrier and the type of service being provided, despite the fact that there may be no significant difference in economic costs among carriers or services.⁶ There is a fundamental disconnect between the one-way access model of interconnection pricing used for long distance service, and the two-way reciprocal compensation model generally used in local interconnection agreements. The Commission has struggled with how to distinguish the services to which the access model is applicable from the reciprocal compensation model.⁷

Both interstate and intrastate access charges evolved from the pre-divestiture Bell System practice of settlements between AT&T's local divisions (and independent companies) and AT&T Long Lines Division. At the interstate level, there was no formalized system of tariffed charges, but AT&T Long Lines remitted to those companies the amounts necessary to recover costs allocated to interstate service through the separations process, including a return

⁶ *Notice* at para. 5.

⁷ See e.g., *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report and Order, CC Docket No. 96-98, 11 FCC Rcd 15499, 16012-13 (1996) (*Local Competition Order*), aff'd in part and vacated in part sub nom. *Competitive Telecommunications Ass'n v. FCC*, 117 F.3d 1068 (8th Cir. 1997) & *Iowa Util. Bd. v. FCC*, 120 F.3d 753 (8th Cir. 1997), aff'd in part, rev'd in part, and remanded sub nom. *AT&T Corp. v. Iowa Util. Bd.*, 525 U.S. 366 (1999) (*AT&T v. Iowa Util. Bd.*), aff'd in part and vacated in part on remand, *Iowa Util. Bd. v. FCC*, 219 F.3d 744 (8th Cir. 2000), cert. granted sub nom. *Verizon Communications Corp. v. FCC*, 121 S.Ct. 877 (2001), Order on Reconsideration, 11 FCC Rcd 13042 (1996) (*Local Competition First Reconsideration Order*), Second Order on Reconsideration, 11 FCC Rcd 19738 (1996) (*Local Competition Second Reconsideration Order*), Third Order on Reconsideration and Further Notice of Proposed Rulemaking, 12 FCC Rcd 12460 (1997) (*Local Competition Third Reconsideration Order*), further recon. pending; *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96-98, *Intercarrier Compensation for ISP-Bound Traffic*, CC Docket No. 99-68, Order on Remand and Report and Order, FCC 01-131, paras. 34-41 (rel. Apr. 27, 2001) (*ISP-Bound Traffic Order on Remand*).

on allocated capital investment.⁸ At the intrastate level, states allocated costs between different regulated services, and directed recovery accordingly.

Interstate interconnection between local and long distance toll networks began to develop formal pricing mechanisms in the 1970s with the advent of competition in the interexchange market.⁹ In 1983, following the break-up AT&T, the Commission adopted uniform access charge rules that governed the fees charged by the local exchange carriers for the costs associated with using the local network for the provision of interstate access services.¹⁰ These charges, however, followed the historical pattern of including the incremental costs of carrying toll traffic and some of the loop and other costs that were "common" between "local service" and "toll service." Moreover, these charges were, as was historically the case, based upon the embedded costs allocated to the interstate jurisdiction by the separations rules, and would be distorted from incremental costs to the extent the separations rules created such distortions.

Simultaneously, states developed intrastate access charge regimes to adapt their own rate design policies to the interexchange competition that developed with the implementation of the AT&T Modification of Final Judgment. With the demise of the integrated Bell System and the implementation of equal access and presubscription, states needed a pricing

⁸ *In the Matter of Access Charge Reform*, CC Docket No. 96-262, Sixth Report and Order, 15 FCC Rcd. 12962 (2000) (*CALLS Order*).

⁹ The Commission supervised an agreement between AT&T, MCI and other interexchange carriers that set rates for the origination and termination of interstate traffic over the local exchange facilities of AT&T's affiliates. The agreement was called the Exchange Network Facilities for Interstate Access (ENFIA). *See, e.g., Investigation of Access and Divestiture-Related Tariffs*, CC Docket No. 83-1145, Phase I and Phase II, Part 1, FCC 85-100, 57 Rad.Reg.2d 1229, 1241 (rel. March 8, 1985).

¹⁰ *MTS and WATS Market Structure*, Memorandum Opinion and Order, CC Docket No. 78-72, Third Report and Order, Phase 1, 93 FCC 2d 241, (1983), *recon.*, 97 FCC 2d 682 (1983), *second recon.*, 97 FCC 2d 834 (1984) (*MTS and WATS Market Structure Order*).

mechanism that transparently allowed the new long distance carriers to interconnect and originate and terminate intrastate long distance traffic. Again, these intrastate access charge systems were based on recovery of embedded costs allocated by state commission to intrastate toll services.

At the time it created a formal access charge regime for the origination of interstate toll calls, the Commission was also faced with the question of how to treat calls to providers of information (then called enhanced) services, and the information services themselves: would these be treated as intrastate common carrier services subject to state regulation, interstate common carrier services, or something else, and would calls to these information services be assessed interstate access charges, intrastate access charges, or no access charges? In separate proceedings the Commission ruled that enhanced services were not common carrier services, and it preempted state regulation of enhanced services using its Title I jurisdiction.¹¹ In addition, the Commission determined that it would treat providers of enhanced services as end-users, as opposed to carriers, for purposes of interstate access charges. As such, enhanced service providers (ESPs) were "exempt" from access charges,

¹¹ See *Amendment of Section 64.702 of the Commission's Rules and Regulations*, 77 FCC 2d 384 (1980) (*Computer II*). The Commission defines "enhanced services" as "services, offered over common carrier transmission facilities used in interstate communications, which employ computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber's transmitted information; provide the subscriber additional, different, or restructured information; or involve subscriber interaction with stored information." 47 C.F.R. § 64.702(a). The 1996 Act describes these services as "information services." See 47 U.S.C. § 153(20) ("information service" refers to the "offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications."). See also *In the Matter of Federal-State Joint Board on Universal Service*, Report to Congress, 13 FCC Rcd 11501, 11516 (1998) (*Universal Service Report to Congress*) (the "1996 Act's definitions of telecommunications service and information service essentially correspond to the pre-existing categories of basic and enhanced services.").

and obtained service from their local telephone companies under intrastate tariffs.¹² Only *carriers* that interconnect with local exchange carriers are required to pay interstate or intrastate access charges.

Although the Commission has revised the interstate access charge regime, the essential characteristics of intrastate and interstate access charge systems remain. The interconnecting long distance carrier is charged by the originating and terminating local networks for carrying traffic from the long distance carrier's point of presence to the originating or terminating customer's loop, and, some cases, to the customer's premises. These charges including transport charges from the POP to the customer's end office, charges for local switching and signaling in the end office itself, and in some cases, a per minute charge for use of the loop. Because these charges are based on historic costs, they include inefficiencies not excluded from the rate base by regulators, costs misallocated by the Commission's separations and cost allocation rules, and costs deliberately allocated to carriers rather than end-users to further "universal service" objectives.

In contrast to the one-way access charge model of intercarrier compensation, the Telecommunications Act of 1996 established a two-way reciprocal compensation regime for interconnection between competing local networks. For interconnection between local

¹² See *MTS and WATS Market Structure Order*, 97 FCC 2d at 715 (ESPs have been paying local business service rates for their interstate access and would experience rate shock that could affect their viability if full access charges were instead applied); see also *Amendments of Part 69 of the Commission's Rules Relating to Enhanced Service Providers*, CC Docket 87-215, Order, 3 FCC Rcd 2631, 2633 (1988) (*ESP Exemption Order*) ("the imposition of access charges at this time is not appropriate and could cause such disruption in this industry segment that provision of enhanced services to the public might be impaired"); *Access Charge Reform*, CC Docket No. 96-262, First Report and Order, 12 FCC Rcd 15982, 16133 (1997) (*1997 Access Charge Reform Order*), *aff'd*, *Southwestern Bell Telephone Co. v. FCC*, 153 F.3d 523 (8th Cir. 1998) ("[m]aintaining the existing pricing structure ... avoids disrupting the still-evolving information services industry.").

networks, the Commission's rules implementing the 1996 Act require the calling party's LEC to compensate the called party's LEC for the additional costs associated with transporting the call from the carriers' interconnection point to the called party's end office, and terminating the call to the called party.¹³ This contrasts sharply with access charge regimes, in which the long distance network receiving an originating call for termination elsewhere pays compensation to the originating network, as opposed to being paid by the originating network for providing the terminating service. (In any event, the interexchange carrier is left to recover its costs for originating and terminating the call from its customers.) The Commission also determined that the charges for both transport and termination must be set at efficient, forward-looking economic costs, not separated embedded costs.¹⁴

As is readily apparent, the Commission was forced to draw a boundary between those calls to which access compensation was due, and those calls for which the reciprocal compensation system applied, so that interconnecting carriers would know whether they were required to pay or entitled to be paid for receiving traffic. At first, the Commission drew this line between "local" traffic and other traffic, although what constitutes "local" traffic has been the subject of substantial litigation. In addition, calls to enhanced service providers, particularly internet service providers (ISPs) have proven to be challenging for the Commission, which has sought to treat these calls as neither being subject to access, nor a full

¹³ See 47 U.S.C. § 251(b)(5). *Local Competition Order*, 11 FCC Rcd at 16024-26, paras. 1056-59.

¹⁴ See *Local Competition Order*, 11 FCC Rcd at 16054-58, paras. 1111-18.

fledged reciprocal compensation scheme, but which instead are compensated under yet a third compensation mechanism.¹⁵

C. Overview of Carrier-Based Voice over Internet Protocol

Voice over IP, as it is continuing to evolve in the marketplace and outside the telecommunications regulatory structure, is highly dynamic and not capable of easy encapsulation. It is clear, however, that IP network architecture varies from traditional telecommunications networks in three distinct ways. First, IP networks are distributed in nature. Unlike a circuit switched network, which generally requires a centralized and hierarchical switching functionality, a distributed IP network is capable of performing core switching functions throughout the network. These functions can even be performed by various entities. Second, IP networks are interoperable. Open architecture ensures that any new service or application developed for an IP network will be interoperable with all features of the network. Finally, IP networks are packet-based. A packet switched network splits the data transmitted over the network into packets that are transmitted over the most efficient route. An IP call optimizes the available bandwidth by statistically multiplexing packets across the network over the most efficient routes.

The hierarchical, “hub and spoke,” circuit switched network, which requires an end-to-end circuit with a fixed bandwidth, was primarily designed for interactive, two-party continuous voice communications. It permits only single session, single service communications. Traditional phones are connected directly via a dedicated 64 kbps pipe to a

¹⁵ *ISP-Bound Traffic Order on Remand*, at paras. 77-82.

circuit switch, and then over a circuit to the called party that is held open for the duration of the call.

By contrast, VoIP is only one of many applications that can be provided over an IP network. IP-enabled networks are designed primarily for interactive, multi-party, media-independent data communications. IP permits simultaneous, multi-session, multi-service communications. Any party on a common backbone can instantaneously communicate with any other party, using the medium of the user's choice, including e-mail, video, audio, instant messaging, file transfer or voice.

VoIP uses the Internet protocol to transmit voice as packetized data over IP networks in real time. Typically, a call traversing an IP network that is interconnected for termination on the public switched network (PSTN) goes through the following steps. First, the communication is originated by an IP phone or by a piece of customer premises equipment (computer or IP conversion device) and delivered to the caller's VoIP provider. This can occur on any IP-network, whether wireline or wireless, cable or DSL. The IP network determines whether the communication will terminate on- or off-net which can include the PSTN. If the communication terminates on another IP device it is simply delivered to that device. If the communication must be terminated to a circuit switched telephone on the PSTN, the call is delivered from the originating local exchange carrier to the IP network via IP media and signaling gateways. Generally, the gateway converts the call from Time Division Multiplexing (TDM) format to an IP-based format. Next, the packets are delivered via the IP network to the terminating media gateway nearest to the destination of the call. The call is then converted from IP format back to a format accepted by the appropriate terminating carrier (such as TDM), at which point the call is terminated. A call may also originate in the

PSTN and terminate on an IP end point, in which case, there is no need for a terminating media gateway.

In contrast to plain old telephone service, voice service provided on an IP network is not necessarily a “pure transmission” service;¹⁶ it is an application that runs on the IP network, just as e-mail, streaming audio, streaming video and web browsing are applications that run on the IP network. Because it is data provided in IP form, VoIP applications can be combined with other IP-based applications. Thus, VoIP can incorporate features that permit customer interaction with stored data, use of computer processing, or have the “capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing or making available information.”¹⁷ Examples of applications combining transmission with stored data or use of computer processing include playing announcements and tones, performing speech recognition, presence monitoring, click access, VIP list creation, unified messaging, conferencing, number translation, find-me, barring, and forwarding services.¹⁸ IP technology blurs traditional distinctions between local and long-distance and between telecommunications and information services.

D. How will VoIP Benefit Consumers?

Voice services provided over IP networks offer the potential for many consumer benefits. One benefit of softswitch-based VoIP services is that the technology permits providers to offer a vast array of services that have never been available over the public

¹⁶ See *Computer II*, 77 FCC 2d at 420, para. 96.

¹⁷ 47 U.S.C. § 153(20) (defining “information service”).

¹⁸ See International Softswitch Consortium, Applications Working Group, *Enhanced Services Framework 3* <http://www.softswitch.org/attachments/ISCAWGFrameworkv5.pdf>.

circuit switched network. The open architecture of softswitches encourages innovation and the development of new services or applications. Interoperability creates opportunities for companies to develop new applications that can ride over any IP transport facilities. This separation of applications from transport will encourage innovation thus making new applications available to consumers in a timely manner. One example of the innovative technologies available to consumers over IP networks is the ability to control call set-up on her own through SIP-enabled customer premise equipment thus allowing “real-time,” person-to-person communication over IP networks.¹⁹ Microsoft has announced plans to include such capabilities in its next operating system, Microsoft Windows XP. Every consumer using this operating system will be able to place PC-to-phone calls and independently select which service provider will carry each call.²⁰

An equally important consumer benefit of softswitch-based VoIP services is the lower cost of operating voice capable networks and of developing new services. IP networks optimize the use of bandwidth available on the network, thus ensuring the most efficient transmission of data. With the exception of any charges imposed by the circuit switched network operator, the costs of operating an IP network are not time-based, nor does VoIP require time or distance monitoring. Rapid decreases in the cost of bandwidth are eliminating

¹⁹ A revolutionary protocol, Session Initiation Protocol (“SIP”) supports many of the traditional PSTN signaling functions in the IP realm and enables the transmission of voice over packet networks. SIP is essentially an IP version of Signaling System 7 (“SS7”), the system that the traditional phone network uses for call set-up, routing, and management of a telephony session over the circuit switched network. SIP rides on top of IP just like Hypertext Transfer Protocol (HTTP), but instead of enabling web page interaction, it carries the information necessary to set up and tear down the communication session. It also provides mechanisms for discovery of end points on the network. SIP enables numerous types of conversations — voice calls using personal computers, access to voicemail messages from an e-mail inbox, or setting up conference calls using the click of a mouse — to take place over an IP network.

the need for distance sensitive charges, as has been seen in the Internet. As the costs for communications decrease, the demand for bandwidth by consumers will increase, and IP networks will offer more economical and efficient means of providing these services.

Finally, VoIP services can be provided with the same convenience and at the same quality levels as more expensive circuit-switched voice. Customers are not limited, however, to the single option of one quality of service level. Instead, providers can tailor VoIP services to meet specific customer needs. For instance, a VoIP end-user such as a mail order company may determine that it wants one level of quality for customer calls, and a less expensive quality for internal corporate calls. VoIP networks are able capable of providing various applications tailored to specific customer needs.²¹

In sum, IP networks are capable of delivering more than voice service. The distributed, interoperable, packet-switched nature of IP networks enables the delivery of voice services along with other applications at lower costs than circuit switched networks. Moreover, VoIP is part of any universal service solution because VoIP will allow next generation networks to deliver a wide range of services more efficiently to all consumers, including those in rural areas.

E. The Current Intercarrier Compensation Regime Punishes VoIP Providers

The patchwork of interconnection pricing regimes requires carriers and regulators to force innovative new services into the most economically promising legacy regulatory

²⁰ See *Windows Messenger Feature in Windows XP Will Usher in the Age of “Real-Time Communication”* <http://www.microsoft.com/PressPass/features/2001/jun01/06-04messenger.asp>.

constructs. As recognized by the Commission, increasing competition and the deployment of new technologies such as IP-based services necessitates a reevaluation of the existing compensation mechanisms.²² For VoIP services, the first question is whether the service is a “telecommunications” service or an “information” service. The Commission originally created these distinctions to ensure that “computer” or “data processing” services were able to evolve in a free, competitive market, rather than subject to the common carrier regulation.²³ In its most recent examination of the telecommunications and information services distinction, the Universal Service Report to Congress (“Stevens Report”),²⁴ the Commission developed three basic models for VoIP, but deferred making pronouncements about the regulatory status of the various forms of IP services: computer-to-computer, computer-to-phone, and phone-to-phone. It is perhaps clearer to rephrase this as packet device to packet device (all IP), packet device to circuit switched device, or vice versa (convergent traffic), and circuit-switched device to circuit-switched device (dial-up gateway service). The packet device could be a computer, customer premise equipment that converts an ordinary phone signal into IP bits before being placed on a data network, or an IP handset.

Even for IP calls that originate and terminate on the PSTN (circuit-switched to circuit-switched calls), what the Commission said in the Report to Congress remains true: it is difficult categorically to call even these services “telecommunications” services as opposed to “information” services. Because VoIP is an application provided on a multifunctional

²¹ See *Voice over IP (VoIP)*, The Technology Guide Series at 5 (1999).

²² *Notice* at para. 13.

²³ See *supra* note 11.

²⁴ *Universal Service Report to Congress*, 13 FCC Rcd at 11543-44, paras. 87-89.

network, much like word processing is an application loaded on a desktop computer, even circuit switched to circuit switched VoIP can be integrated with other applications such that the service qualifies as an information service (or enhanced service under *Computer II*). A circuit-switched to circuit switched VoIP call could also have enhanced functions that render that call an information service.²⁵

When VoIP gateways are treated as “end-users” for the purposes of intercarrier compensation today – as required by the ESP exemption -- the IP network and the circuit switched network can be connected using two-way co-carrier trunks. This network configuration allows an interconnecting carrier to make efficient use of facilities. When misguided efforts are made to try to apply either intrastate or interstate access charges to this traffic, however, the usual structure requested is to segregate the access traffic into access trunks, separate from any locally originated traffic. This requires duplicate facilities and imposes different charges on the same minute of traffic using the same functionalities. In short, it is economically irrational and introduces artificial regulatory inefficiencies that only limit the capabilities of the service and the promise to consumers.

Attempting to apply access charges imposes other unnecessary artificialities on the VoIP network. First, softswitch-based VoIP and circuit switched voice have different underlying cost structures. Softswitches and gateways used to provide VoIP services can be installed and operated at a fraction of the cost of circuit switches. VoIP networks interconnecting with circuit switched networks, therefore, have lower costs of termination than the interconnected circuit switch networks.

²⁵ See Jonathan Weinberg, “Internet Telephony Regulation”, *Internet Telephony* (MIT 2001).

In addition, VoIP services impose fewer burdens on interconnecting networks than do traditional switched access services. As described *supra*, in an IP to PSTN call, the originating provider delivers the call to the IP network through IP media and signaling gateways. The call is then delivered to a terminating media gateway near the called party. As found by the Public Utilities Commission of Colorado, in Level 3's arbitration proceeding with Qwest Corporation ("Qwest"), VoIP does not use the incumbent LEC network in the same manner as traditional switched access calls:

...[W]ith IP Telephony the CLEC's gateway and IP network are used to deliver the call from the end-user at the originating end to the called party at the receiving-end. IP Telephony does not use Qwest's routing, switching, and transmission path services. Because the functionality and network use for IP Telephony is different, it should not be subject to switched access charges."²⁶

These varying cost structures are reflected in the fact that VoIP services can be provided on a flat-rate, capacity basis since the cost of providing the service is not time or distance sensitive. Imposition of an access charge system that differentiates between interstate and intrastate traffic would require carriers to at least estimate the amount of interstate versus intrastate traffic. Although a call being terminated from the VoIP carrier through a gateway to a customer on the PSTN would use the same functionalities regardless of whether that call originated locally (such that reciprocal compensation would apply), interstate (such that interstate access would apply) or intrastate (such that intrastate access would apply), the amount of compensation paid would vary in each case.

²⁶ *In the Matter of Petition of Level 3 Communications LLC, For Arbitration Pursuant to §252(B) of the Telecommunications Act of 1996 to Establish an Interconnection Agreement with Qwest Corporation*, Docket No. 00B-601T, Initial Decision, Decision No. C01-312 (Co. P.U.C. Mar. 16, 2001), at 30.

As carriers deploy these innovative services, the Commission will be faced with the dilemma of maintaining the current compensation regimes by stretching legacy definitions to cover emerging technologies or developing a new intercarrier compensation regime that is technologically neutral and promotes the deployment of efficient networks. Chairman Powell has recognized this dilemma stating that classifying IP telephony as subject to traditional regulatory regimes is “probably the \$64 billion question, literally.”²⁷ Powell added that “if the factual analysis were to suggest it was something else [i.e. not telecommunications], it would legitimately fall outside the traditional application of these subsidy programs.”²⁸ The current intercarrier compensation mechanisms are symmetrical and based upon the higher-cost network’s costs. This system discourages service providers from transitioning to more cost-effective technology. The Commission should not maintain a compensation regime that insulates these carriers from the consequences of failing to make such a transition.

III. Bill and Keep Arrangements for Interconnection

In the Notice, the Commission expressed its preference to adopt a unified approach for all intercarrier compensation mechanisms. To this end, the Commission seeks comment on the merits of a bill and keep approach for all traffic.²⁹ Level 3 has always advocated moving the intercarrier compensation regime to a forward-looking, cost-based model so that carriers were appropriately compensated for the functionality provided with a reasonable profit. Level 3 believes, however, that absent a truly competitive market where carriers could negotiate

²⁷ See “Powell: Time to ‘Retool’ the FCC”, *ZDNet: eWEEK*, Mar. 29, 2001.

²⁸ *Id.*

²⁹ *Notice* at paras. 37-57.

compensation levels freely without one party exerting its market power and exerting premium rents for access to its end-users, determining those costs could be time consuming, litigious, require considerable financial resources from carriers and regulators, and would probably result in asymmetrical rate structures for ever changing technologies.

To eliminate the artificial inefficiencies that the regulatory model imposes on the delivery of services, Level 3 recommends that the Commission explore the elimination of payments between carriers and adopt an interconnection pricing regime for all traffic based on bill and keep for origination and termination, whereby end-users pay for the benefit of making and receiving calls. Although it may not always be true that both the calling and the called party benefit from the call, bill and keep for origination and termination is more consistent with the way customers use the communications networks of today. No matter whether it is local, long distance, or some other kind of call, it is no longer accurate to assume that the calling party is generally the primary beneficiary of a call. Consumers are increasingly connected through a variety of communication devices that reflect both the desire to “connect” and “be connected” with the rest of the world. In most instances, both the originating and terminating end-user derive some benefit from the call.

Level 3 also recommends that the Commission continue its “rules of the road” requiring one point of interconnection per local access and transport area (LATA) and requiring each carrier to bear its own costs for bringing its traffic to the point of interconnection. Under such an agreement, each carrier would be required to transport its traffic to the designated interconnection point, thus eliminating the current practice of charging competitive carriers special access rates for transport between the interconnection point and the incumbent LEC end office.

A. Recovering Origination and Termination Costs on a Bill and Keep Basis from the Cost-Minimizer Could Simplify Intercarrier Compensation

Level 3 believes that, implemented properly, bill and keep in lieu of intercarrier compensation could solve many of the problems of the current interconnection pricing regimes. First, bill and keep eliminates regulatory arbitrage opportunities, including those arising from the preferential treatment of information services, by moving the entire industry away from jurisdictional classifications. The brief history of access charges and reciprocal compensation shows that the economics of interconnection pricing are not technologically neutral, but instead are driven by legacy regulatory structures, the switching hierarchy of monopoly circuit-switched providers, and the embedded costs and revenue streams carriers claim in providing service within these regulatory boundaries. As stated by the Commission, “[t]he interconnection regime that applies in a particular case depends on such factors as: whether the interconnecting party is a local carrier, an interexchange carrier, a CMRS carrier, or an enhanced service provider; and whether the service is classified as local or long-distance, interstate or intrastate, or basic or enhanced.”³⁰

These differences provide incentives for telecommunications providers to classify services provided across local calling areas (what would traditionally be long distance) as enhanced services in order to avoid access charges. Or, as Patrick DeGraba describes the problem in the *COBAK Proposal*, it creates a source for regulatory arbitrage.³¹ It is important to remember that engaging in “regulatory arbitrage” is not evil or bad but is the

³⁰ Notice at para. 5.

³¹ *COBAK Proposal*, at para. 77.

rational economic result when the regulatory system imposes varying levels of economic burdens for the basic functions of transport and termination. Each new classification of traffic and the resulting economic model encourages market entrants to leverage the economic benefits of a particular classification, leading to greater regulatory uncertainty and additional legal costs as parties debate appropriate compensation. The complicated structure of the compensation scheme engages the FCC, state commissions, and service providers in endless disputes over regulatory definition-parsing and line-drawing, with different lines dramatically altering business plans.

Second, recovery of origination and termination costs from end-user customers on a bill and keep basis should end or reduce the terminating access monopoly problem. As the Commission described in the *Notice*, and has been widely discussed in the economics literature,³² under a CPNP regime, the end-user's selection of its "last mile" carrier creates a *de facto* termination bottleneck. The bottleneck arises from the fact that the calling party's carrier must pay the terminating carrier whatever price it demands because the terminating carrier is usually the only way to deliver traffic to that particular end-user customer.³³

By requiring the terminating carrier to recover its costs from its own end-user customers, the end-user can compare retail prices charged and services offered by the "last mile" carriers and choose the most efficient way to reach her, given her specific needs. For example, a customer that spends little time at home and is highly mobile may wish to "cut the cord," receive all calls through a wireless connection, and pay the costs of the mobile

³² See *Notice* at para. 38. See generally, ROBERT W. CRANDALL & LEONARD WAVERMAN, TALK IS CHEAP: THE PROMISES OF REGULATORY REFORM IN NORTH AMERICAN TELECOMMUNICATIONS (Brookings, 1996).

³³ See *COBAK Proposal* at para. 89.

functionality. The customer may prefer to sign up for service with a provider that uses highly efficient, low cost technologies such as VoIP. Or the customer may wish to stay with the older, embedded-cost incumbent LEC circuit switched service, and pay the full costs of being a subscriber on that network. The subscribing end-user controls the decision of whether to purchase services from the lowest cost provider and can select providers weighing both cost and functionality, without imposing the costs of that choice on other network users. She may also reject a provider that charges above cost rates. The subscribing end-user, therefore, is the “cost minimizer.”

For origination and termination, these conclusions are consistent with both the DeGraba *COBAK* and the Atkinson-Barnekov *BASICS* proposals. Both assign responsibility for end office switching and loop to the subscribing end-user. DeGraba bases this portion of the *COBAK* proposal on the principle that both parties to a call benefit. Having the end-user bear the cost is justified, therefore, by the principle of cost minimization. In contrast, a CPNP system, even one with a uniform "minute-is-a-minute" interconnection rate that is the same for access traffic and for local traffic, does not necessarily have the same advantage of internalizing all consequences of the subscribing end-user's choice of carrier to that subscriber. The theory of a CPNP system is that the incremental costs of termination are charged to the caller. However, different networks will have different incremental costs. A CPNP system could be constructed that would charge the most efficient termination rate to the calling party, with all other costs borne by the called party, but in practice this would be a difficult system to administer, with constant litigation over the appropriate level of the most efficient termination rate.

Finally, bill and keep eliminates the need for regulatory intervention to set or adjudicate interconnection prices. While economic theory would indicate that regulatory arbitrage could be avoided simply by "getting the price right" (assuming that the regulator did not then also impose additional limitations on retail pricing), in practice "getting the price right" is a difficult regulatory exercise that injects substantial uncertainty into business planning. As described by DeGraba, incumbent LECs (and other LECs when they have bottleneck market power) often have an incentive to push access rates as high as possible.³⁴ Interconnecting networks that predominantly deliver traffic or that must pay for origination -- push regulators for low interconnection prices because interconnection is a cost otherwise outside their control. By eliminating the transfer of payments between carriers for interconnection, bill and keep both eliminates this constant regulatory litigation, and therefore ensures that interconnecting carriers can better provide their services according to their own costs, without being tied to the cost structures of other networks.

B. Policy Benefits Result When All Traffic is Treated the Same

Although bill and keep can have substantial advantages in terms of empowering the subscriber to choose the local service provider that best meets her needs, those advantages are reduced substantially if only some traffic is subject to bill and keep termination, while other traffic is subject to CPNP termination. At the simplest level, any minute of traffic handled on a CPNP basis shifts the costs of selecting that network provider to other consumers. Handling intrastate traffic, for example, on a CPNP basis while handling other traffic on a bill and keep

³⁴ *Id.* at para. 91.

basis would substantially undermine the price signal that a bill and keep regime would send to the subscribing end-user to select the most efficient technology that meets her needs.

Moreover, having two different interconnection pricing schemes for what is largely the same function will open the door to strategic pricing gamesmanship, and potentially impose inefficient network engineering costs. For example, if interstate traffic is bill and keep, but intrastate access traffic is CPNP, carriers will need to monitor the traffic by destination to ensure that a minute of traffic falls into the proper payment scheme. This could also lead to requirements to segregate the CPNP traffic into trunks separate from bill and keep traffic, as is the case today for access traffic versus local traffic.

In short, the Commission must recognize the absurdity and the inefficiency of the fact that a minute of traffic being transported over the same kinds of facilities and through the same kinds of switches could be subject to at least four different compensation regimes just because of how that minute was originated or the customer for whom it is intended. As Commissioner Ness noted in her statement accompanying the *Notice*, “we still have in today a system under which the amounts, and even the direction, of payments vary depending on whether the carrier routes the traffic to a local carrier, a long-distance carrier, an Internet provider, or a CMRS or paging provider. In an era of convergence of markets and technologies, this patchwork of regimes no longer makes sense.”³⁵ In fact, as long as this admittedly nonsensical patchwork of regimes remains in place in any respect – as long as any one minute is worth more or less than any other minute as it traverses a tandem switch or common transport – this only generates artificial uneconomic payments throughout the

³⁵ *Notice*, Separate Statement of Commissioner Susan Ness.

industry and invites carriers and others who connect with them to seek profit in the differences between the regimes.

Other than some fealty to historic, but not statutorily or constitutionally mandated, notions of the division of responsibility between state commissions and the FCC, there is no economically rational reason why it would be desirable to maintain two different intercarrier compensation systems.

IV. Allocation of Transport Costs

Whether the Commission adopts an interconnection pricing regime based on bill and keep or maintains the current access charge and reciprocal compensation regimes, it must not lose sight of the rules that will govern the interconnection of networks. Unless the interconnection rules are properly crafted, the benefits of a unified intercarrier compensation regime could be lost through increased facilities charges. This is especially true if the Commission adopts a regime that will require any carrier to extend the reach of its network. The COBAK proposal, for example, allocates all transport costs to the originating network, requiring the originating carrier (or the calling party's network) to carry traffic to the called party's central office or to lease transport facilities from another carrier.³⁶ The terminating carrier bears no transport costs, because the point of interconnection is at the terminating carrier's end office.

The COBAK proposal is problematic for the reasons identified by the Commission and by DeGraba – namely, COBAK invites opportunity for networks to claim that their central offices are close to the end-user as possible, and may also cause networks to locate

³⁶ *COBAK Proposal* at paras. 71-72.

their central offices inefficiently.³⁷ As such, COBAK would erect a substantial barrier to entry. Under COBAK, where interconnecting networks are unable to negotiate a meet-point interconnection arrangement, the competitive carrier would have to build transport to each and every incumbent LEC end office, or alternatively it would have to contract with the incumbent LEC or another carrier to perform that function. Even if one assumes that the incumbent LEC would lease transport to its competitors at forward-looking cost-based rates – an assumption contrary to fact given the standard practice of many incumbents to charge access rates for such facilities leased by competitive LECs – this creates its own new inefficiencies. In essence, it calls for competitors to duplicate the inefficient historical incumbent LEC “hub and spoke” network – a network structure of multiple local switches that is not required today to deliver services.

A. The Commission Must Reaffirm a Single Point of Interconnection Per Appropriate Geographic Region

To avoid introducing inefficiencies into the deployment of competitive networks, the Commission must reaffirm the “rules of the road” it has established with regard to the number and location of POI between interconnecting carriers. These rules must ensure that a unified intercarrier compensation regime, such as COBAK, does not become a barrier to entry by requiring competitive LECs to build unnecessary or duplicative transport facilities and that the scope of the geographic area is large enough to permit innovation in service packages and calling scopes. Requiring a carrier to build out for interconnection or buy transport facilities from the incumbent prior to turning up service may only have the perverse result of deterring

³⁷ *Id.* at para. 103.

competitive entry, as carriers concentrate their entry strategy on those calling areas where they will accumulate enough traffic to justify the investment in the interconnection facilities needed to reach there.

In establishing and reconfirming rules regarding intercarrier compensation and the geographic scope of interconnection, the Commission should ensure that all carriers have a clear, low cost path to interconnection. In the 1996 Act, Congress created differing levels of interconnection obligations between competitive and incumbent carriers Section 251(c)(2)(B) requires incumbent LECs “to provide, for the facilities and equipment of any requesting telecommunications carrier, interconnection with the local exchange carrier’s network . . . at any technically feasible point within the carrier’s network.”³⁸ In the *Local Competition Order*, the Commission found that section 251(c)(2) gives competing carriers the right to deliver traffic terminating on an incumbent LEC’s network at any technically feasible point on that network, rather than obligating such carriers to transport traffic to less convenient or efficient interconnection points.³⁹ The Commission has reiterated this point and noted specifically that competitive LECs can choose a single technically feasible POI per LATA.⁴⁰

First, the Commission should reaffirm that incumbent LECs must permit a single POI of the competitive carrier’s choosing within a defined geographic region, such as the Commission requires in each LATA. In addition, as described below, to fairly assess

³⁸ 47 U.S.C. §251(c)(2).

³⁹ *Local Competition Order*, 11 FCC Rcd at 15608, para. 209.

⁴⁰ *In the Matter of Application of SBC Communications, Inc. Pursuant to Section 271 to Provide In-Region, InterLATA Services in Texas*, Memorandum Opinion and Order, CC Docket No. 00-65, at para. 78 (rel June 30, 2000) (*Texas 271 Order*).

transport costs so that the incumbent LEC does not bear the burden of carrying all traffic to a single interconnection point, the Commission should establish thresholds where significant traffic volumes justify establishing additional POIs. Requiring multiple POIs upon market entry without any reference to traffic presents a barrier to entry by compelling competitive carriers to build or buy facilities in markets where they have yet to win or serve even a single customer. The additional advantage of a single POI per LATA is that it limits opportunities for “free-riding” by small regional networks on larger ones.

The second rule, confirmed by the Commission in the *TSR Wireless Order*, is that each carrier is responsible for delivering its originating traffic to the POI and recovers such costs in the rates it charges to its end-users.⁴¹ The Commission should reconfirm this rule and clarify that carriers must bear the cost of building facilities to the POI, and may not charge the interconnecting carrier for the transport facilities on their own side of the POI. Together, these two rules ensure that competitive carriers are able to build-out their networks in the most efficient manner and are not burdened with transport rates that fail to reflect accurately how the facilities are used.

B. Default Threshold for Additional Points of Interconnection Could Be Reasonable

In addition to permitting competitive carriers to establish a single POI per LATA, the Commission should establish a default threshold based upon traffic volumes for additional points of interconnection. State commissions have looked favorably upon this proposal in

⁴¹ *TSR Wireless, LLC et al. V. US West Communications, Inc., et al.*, File Nos. E-98-13, E-98-15, E-98-16, E-98-17, E-98-18, Memorandum Opinion and Order, FCC 00-194, para. 34 (rel. June 21, 2000) (*TRIS Wireless Order*).

recent arbitrations and have established varying thresholds.⁴² Such an alternate proposal would give certainty to carriers in terms of knowing when additional POIs would be required and would avoid placing a burden on competitive carriers until such time as traffic volumes dictate additional transport expenditures. In other words, a competitive carrier would not be required to “flash cut” to a ubiquitous interconnection architecture upon market entry, but could instead be required build out its interconnection trunking network as traffic volumes dictate.

V. Other Issues

A. Protecting Affordable Universal Service.

It is critical for any new intercarrier compensation mechanism to maintain affordable universal service. Because the current intercarrier compensation systems (most notably interstate and intrastate access charges) have been vehicles for generating implicit universal service support and achieving other social policy goals, it is important that the Commission take further steps to explicit universal service support and to target that support to those areas

⁴² This approach has been adopted by several state commissions in trying to balance transport obligations and obstacles to competitive entry. *See, e.g., In the Matter of The Petition of Level 3 Communications, LLC for Arbitration with BellSouth Telecommunications, Inc. Pursuant to Section 252(b) of the Communications Act of 1934, as amended by the Telecommunications Act of 1996*, Case No. 2000-404, Order (Ky. P.S.C. Mar. 14, 2001), at 3 (finding that an additional POI once the traffic at a BellSouth access tandem reaches an OC-3 level of capacity “weighs the balance between [1] the efficiencies to be gained by not requiring new entrants to deploy a POI in every local calling area and [2] the incumbent’s interests in paying minimal originating traffic costs”); *Level 3 Communications, Inc. Petition for Arbitration Pursuant to Section 252(b) of the Telecommunications Act of 1996 to Establish an Interconnection Agreement with Illinois Bell Telephone Company d/b/a Ameritech Illinois*, Docket No. 00-0332, Arbitration Decision (Ill.C.C. Aug. 30, 2000), at 31 (holding that additional POIs should be established at Ameritech access tandems once traffic at those locations reaches an OC-12 level of traffic, in order to allow the competitive LEC “every opportunity to establish itself in the Chicago LATA and to progress at a speed that is commensurate with sound economic growth”).

where necessary to maintain affordable rates. An important corollary, however, is that universal service must not be more than necessary to keep rates within the upper threshold of affordability and it should support provision of service and not just high returns.

In the Commission's proceeding regarding reforming the Universal Service Fund (USF) contribution methodology,⁴³ Level 3 supports implementation of a capacity-based assessment for universal service contributions. As argued in Level 3's reply comments, a capacity-based assessment eliminates the impossible task of differentiating service revenues between interstate and intrastate, and between telecommunications revenue and all other revenue. A capacity-based assessment is, therefore, consistent with a bill and keep interconnection pricing regime that also eliminates the need to define traffic based on legacy regulatory distinctions. Unlike the current USF end-user revenue model, a capacity-based assessment ensures that all providers, regardless of the technology used to provide access to the universal converging network, contribute to the USF. Perhaps most significantly, a capacity-based contribution assessment, combined with a move to bill and keep, would create an explicit universal service funding mechanism and protect the fund from a dwindling contribution base.

In addition, as a key component of a shift to explicit support Lifeline support should be expanded so that low income consumers, particularly those with household incomes below

⁴³ *In the Matter of Federal State Joint Boards on Universal Service, 1998 Biennial Regulatory Review – Streamlined Contributor Reporting Requirements Associated with Administration of Telecommunications Relay Service, North American Number Plan, Local Number Portability, and Universal Service Support Mechanisms: Telecommunications Services for Individuals with Hearing and Speech Disabilities, and the Americans with Disabilities Act of 1990; Administration of the North American Numbering Plan and North American Numbering Plan Cost Recovery Contribution Factor and Fund Size; Number Resource Optimization; Telephone Number Portability*, CC Docket Nos. 96-45, 98-171, 90-571, 92-237, 99-200, 95-116, Notice of Proposed Rulemaking, FCC 01-145 (rel. May 8, 2001).

the federal poverty guidelines, do not face higher bills. To the extent that shifting to a bill and keep regime for termination charges shifts switching costs from a per minute, carrier-paid recovery to a flat-rate, end-user paid recovery, it would be appropriate to expand Lifeline support to offset any increases for low-income consumers.

Moreover, under a bill and keep regime, there will be likely some need to expand universal service support for some rural areas in which the recovery of all “last mile” costs would be prohibitive and force consumers to drop service. The Commission should also, however, take a hard look at whether any necessary increase in monthly subscription fees would at all jeopardize affordability. Commission statistics show that telephone subscribership exceeds 96% for the 58% of American households with incomes over approximately \$34,000.

Opening the door to flat rate VoIP calling plans, which would be facilitated by a bill and keep intercarrier compensation system for all traffic, would also likely benefit affordability by reducing the variability in charges for low-income consumers. This would help alleviate the problem of low-income consumers losing telephone service because of inability to pay a high telephone bill, particularly in those jurisdictions that permit local service disconnection for non-payment of toll charges.

B. Relationship to the Internet

Although the Internet backbone practice of peering is similar to bill and keep as proposed by Level 3, it is not necessary for the Commission at this time to try to regulate Internet interconnection through this proceeding. Instead, Level 3 has consistently urged the industry to self regulate. Interconnection between Internet backbone providers is somewhat

different, most notably because the dominant network does not have 92% of all end-users on its network. While network “tipping” on the Internet backbone is a real concern, such market power issues can be addressed through other means. For example, Level 3 last year published public guidelines for its peering arrangements. Genuity, WorldCom and Sprint have done likewise. In the PSTN, there is no apparent alternative to regulation to contain the market power that the incumbent LEC has, both as a result of its control of bottleneck last-mile facilities and the fact that it has such an overwhelming majority of subscribers on its network.

VI. Conclusion

For the foregoing reasons, Level 3 recommends that the Commission consider a bill and keep compensation scheme where the originating and terminating carriers each recover their costs from their end-user customers, thereby eliminating a transfer of payments for the cost of the loop and local switching. Moreover, Level 3 urges the Commission to reaffirm the “rules of the road” it has established with regard to the number and location of points of interconnection between carriers, including the rule that carriers must pay for the cost of delivering their traffic to the point of interconnection.

Respectfully submitted,

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